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17. ABSTRACT (MAX. 250 WORDS)

A description of the inception, objectives, operation, equipment, and personnel of the Learning and Instructional Resources Center of the University of Miami is given. Faculty committees were appointed at the University of Miami to work out the philosophy of a new division within the University which would meet the problems of the inadequacy of classroom space, the need for better and more efficient teaching methods, the failure of higher education to utilize adequately technological resources, and the need for professional communication specialists to identify with accepted educational values. The outgrowth of faculty deliberations was the Learning and Instructional Resources Center.

The Center was built in an octagonal shape; eight 300-seat classrooms were placed around a central core containing projection equipment. Wedge-shaped classrooms were designed to allow students' eyes to follow a natural focus to the apex, where the projection screen, the lecturer's podium, and the demonstration table were located. Classrooms were equipped with the latest lighting, projection facilities, teaching aids, language translation facilities, electronic pointers, and audiovisual equipment and materials.

The design and concentration of equipment in the Center provided a challenge for the solution of problems plaguing educational television. An electronic feedback system was instituted to aid in researching questions about the medium. An easily operated and concealed response station was installed at each seat; chart recorders kept a permanent record of class responses for analysis after a lecture. The charts were compared with the original lecture delivery by simultaneous playback with a recorded videotape.

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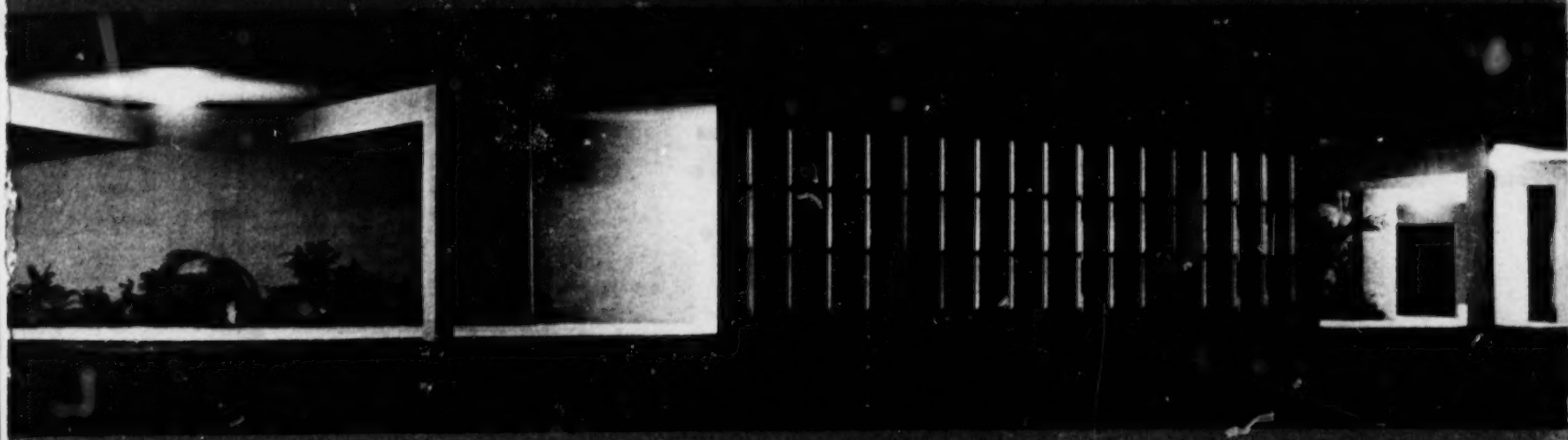
LEARNING AND INSTRUCTIONAL RESOURCES CENTER



University of Miami • Coral Gables, Florida

Text from
an illustrated address given by
CHARLES DOREN THARP, PhD.
Vice President for Administration
University of Miami
at the 18th national conference of the
ASSOCIATION OF HIGHER EDUCATION
March 4, 1963
Chicago, Illinois

LEARNING AND INSTRUCTIONAL RESOURCES CENTER

administered by

DIVISION OF COMMUNICATIONS SERVICES

Roy J. Johnston, Director

University of Miami • Coral Gables, Florida

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A NEW CONCEPT

In the fall of 1959, the Administration of the University of Miami recognized the emergence of certain problems as major to a rapidly expanding institution of higher learning. Faculty committees were appointed to work out the educational philosophy of a new division within the University—University College—with responsibility for the fundamental disciplines of Humanities, Social Sciences, and Natural Sciences—a decision placing some 4,000 to 6,000 freshman and sophomore students in one college.

All students take approximately three-fifths of their work for the first two years in University College. The remainder of their studies are in other divisions.

The decision to activate University College placed emphasis on the following problems:

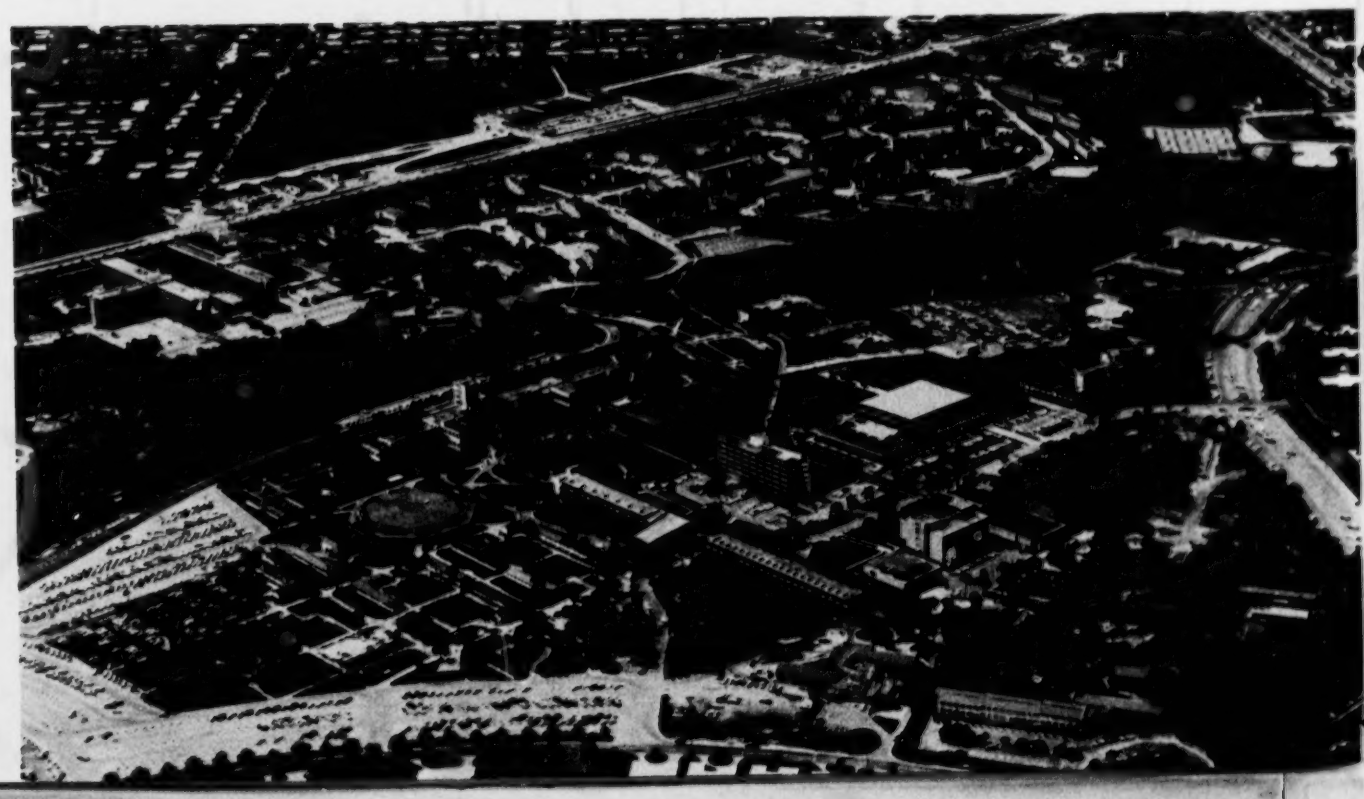
a) The inadequacy of classroom space.

b) The imperative need for better and more efficient methods of instruction.

c) The failure of higher education generally to utilize adequately technological techniques and resources peculiarly adaptable to its needs.

d) The urgency of having professional communication specialists gain sufficient objectivity for identification with accepted educational values.

On a campus where rapid expansion was devouring the space once believed adequate for a large institution, it was important that a class-



room building be designed to accommodate the greatest possible number of students in the smallest possible area without sacrificing any of the values of instruction.

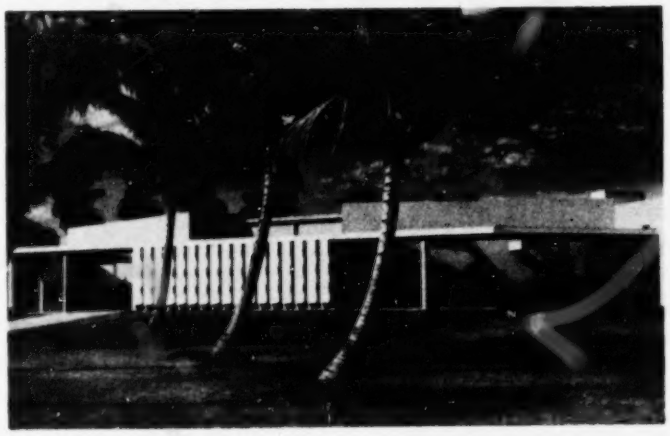
Indeed, it was realized that such a building should also recognize our second problem and attempt to upgrade our instructional processes by attention to better and more efficient methods.

The combination of needs caused us to recall the plans of a visionary, who, prior to his death in 1956, had served as Director of Audio-Visual Aids at the University. This visionary, Harold Taylor Kay, perhaps ahead of his time in realizing the desirability of a marriage of instructional needs to technological progress, had once outlined to us plans for an octagonal classroom building with a hollow core designed for equipment storage and making use of conventional projection apparatus. The Administration figuratively dusted off Mr. Kay's concept, added ideas of its own and those of its staff; we became increasingly enthusiastic and called in an architect, Robert Fitch Smith, for consultation.

The building concept grew like "Topsy." We visited Dr. Harold Gores of the Educational Facilities Laboratories and applied for a grant to aid us in planning. Happily, the grant was made. Consultants in electronics, in projection, in educational television, in educational instruction, caught some of our enthusiasm and added ideas of their own. Plans and ideas became voluminous.

We added and added until the realities of economics caused us to begin judicious subtraction. Finally, the plans achieved a point where we appeared to have gained at least the majority of our objectives. We had a building under construction which could accommodate 2,400 students at a time, which could be used to present the lecture of one professor to 2,400 students at a time, or could be used to present the lectures of several professors to several classrooms at any one time.

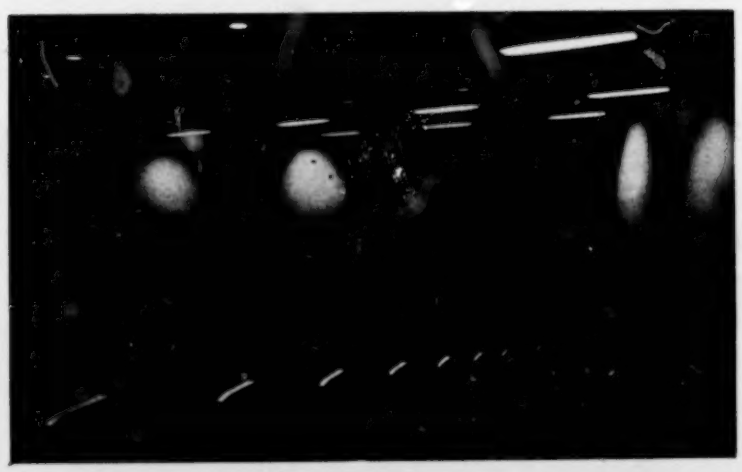
The Octagonal Building under contruction.



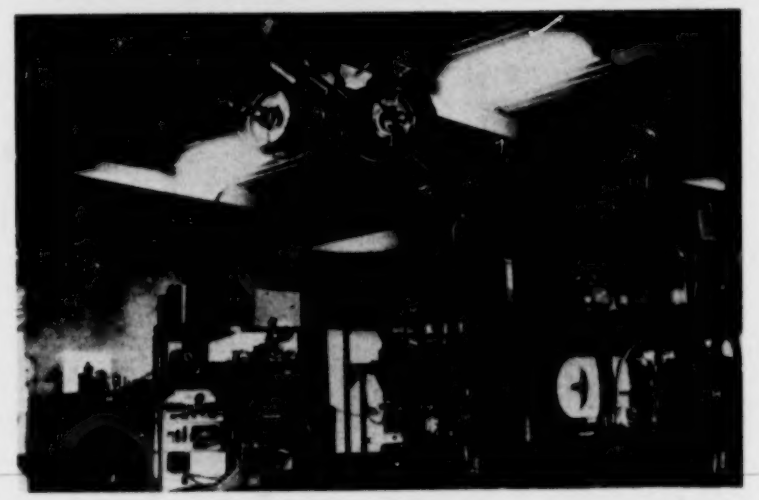
Building completed in the spring of 1961.

The building was designed to utilize every aural and visual aid to instruction in every conceivable combination that we knew or could imagine. The building would be capable of supplying instruction to between 4,000 and 6,000 students of University College, or for the instruction of small classes in approximately seventy-five percent of our curriculum needs at that time.

The Learning and Instructional Resources Center, as it became known, gained reality in the spring of 1961. Because it was unique, the building suffered not only the problems germane to any new construction but developed difficulties peculiar to itself. What type of floor covering should be used on floors with greater than normal auditorium gradient? How did you provide for possible replacement of sheets of heavy plate glass 10 x 12 feet in size? How did you place forty-four projectors so that the projection beams did not interfere with each other?



Floors had greater gradient than other auditoriums.



Problem of how to place forty-four projectors.

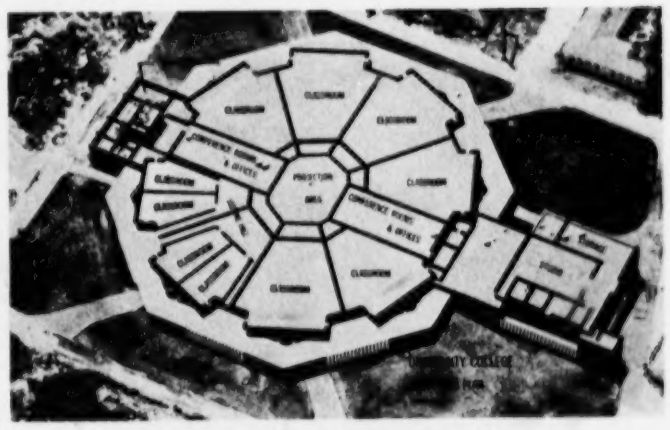
There were many problems and many solutions. Where were the people with knowledge and experience to staff such an operation? What reaction could be expected from faculty members assigned to teach in the Center? What training would be necessary for faculty use of the building? And as the operation solidified, the answers fell into place. Staff was hired, faculty appointments made, equipment bought, and in September, 1961, the building began full-scale operation.

Staffed by the University's Division of Communications Services, the Learning and Instructional Resources Center is at present primarily a teaching instrument or aid of University College. Its major objective is to maximize the impact of quality teaching through imaginative use of video and audio illustration and demonstration.

It might be said that in developing the academic program of University College, we were aided first by a grant from the Fund for the Advancement of Education to provide release time for TV lecturers from our staff. We think we have selected those best able to communicate most effectively through the TV medium. Somewhat later, another grant was made by the Fund for the Advancement of Education for our program which is designed to aid the faculty in making the best use of the new instructional facility, and to increase their effectiveness in offering the basic courses. The combination of academic experience and quality represented by the faculty of the University of Miami and the professional competence of the technical staff of the Center has already resulted in a variety of new techniques designed to enhance the learning process.

Physically, the Center is octagonal in shape with eight 300-seat classrooms placed around a central core which contains all projection equipment. Wedge-shaped in design, the classrooms allow the eyes of the students or audience to follow a natural focus to the apex of the wedge where are located the projection screen and the lecturer's podium or demonstration table.

Eight 300-seat classrooms around a central core.

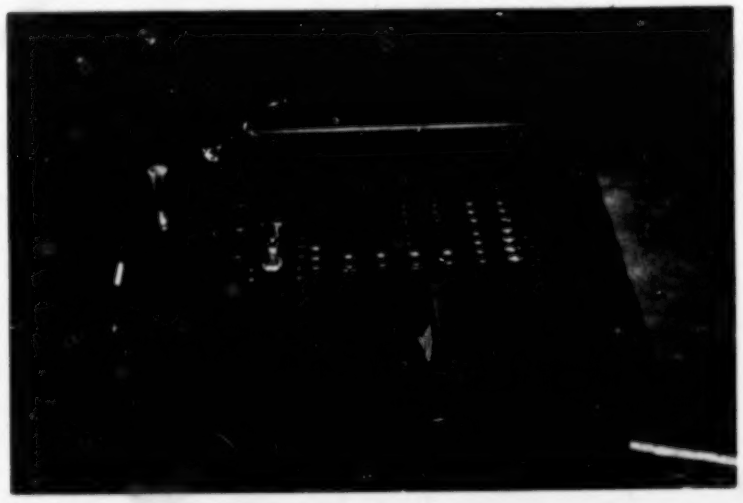


CLASSROOMS AND EQUIPMENT

The ten-foot square projection screen is used for all projection on a rear screen basis including closed-circuit television. Although slightly below the standards of brilliance and size set by the Society of Motion Picture and Television Engineers, experts in the field of projection have compared the projected pictures with conventionally projected images and declared the results of the rear screen projection to be more than adequate in resolution and brilliance.

Rear screen projection gives adequate resolution and brilliance.

Podiums or lecterns at the apex of each classroom are equipped with complete controls for room light-level, for remote control of 16 millimeter film-strip projectors, 2 x 2 slide projectors, 3¼ x 4 slide projectors, 35 mm. film strip projectors and for control of all audio-levels including public address system, film-sound system and closed-circuit television system.



Lecterns at apex of classrooms are equipped with controls.

Classroom aisles are covered by a special matting of rubber and nylon to minimize slippage, and the floors in the seating areas are covered with vinyl tile impregnated with carborundum chips. The walls are covered with vinyl and the ceilings by sound-absorbent tile. Seats are covered by a nylon material designed to absorb the echoes normally refleced from conventional seating in a partially empty audiorium.

Floor, seat and wall coverings selected for sound and slippage control.

Included at the apex of certain of the classrooms are sources of electricity, vacuum, compressed air, gas, and hot and cold water, so that these utilities may be connected with science demonstration tables for classroom experiments. In the near future, industrial type vidicon cameras will be installed in classrooms used as science demonstration rooms, making possible the amplification of minute detail for projection on the classroom screens.

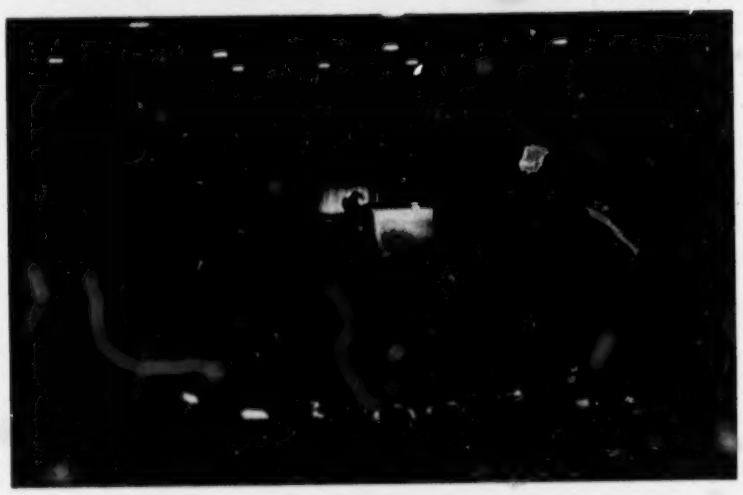
Each classroom is fitted with an electronic pointer for use by the instructor in detailing features of a projected picture. Each room contains two blackboards, 4 x 10 feet in size, mounted so that vertical positioning may be achieved. For use with blackboards during the projection of a picture, ultra-violet or "black" light has been provided, thus written comments by a professor using specially treated chalk may be seen by the students.

It is further planned to install motor-driven rolls of acetate over plate glass mounted in the top surfaces of each lectern. This device, in conjunction with a flying-spot scanner mounted below the acetate, will allow the instructor to use the top of the lectern as an overhead projector with the image being amplified and presented on the projection screen.

One three-hundred seat classroom is equipped with language translation facilities making possible the instantaneous translation of a lecture into four languages with an outlet for each language available at each of the three hundred seats.

Each classroom is equipped with a dual system of incandescent and fluorescent lights. For conventional lecturing, both systems are used at full intensity; for projection and for note-taking during projection, the fluorescents are turned off

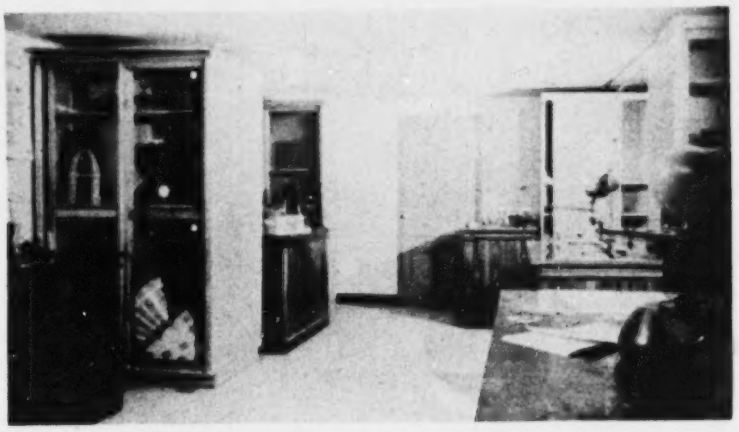
Classrooms are equipped with dual lighting systems.



Incandescent and fluorescent lighting may be dimmed to desired level.

and by controls mounted on the lectern, the incandescents are dimmed to the desired level. Future planning includes a relay control, which, upon turning off the fluorescents, will activate electronic eyes that will automatically dim the incandescent lighting to a pre-determined, scientifically measured level.

In constructing the central core of the building, provision was made for a balcony or walkway around the core area, giving access to the front platform of the classrooms, and to a specially equipped room designated as the Science Preparation Room. Cabinets for storage of laboratory equipment and chemicals have been installed in the Science Preparation Room, as have soapstone sinks, emergency laboratory shower, and sources for ordinary laboratory work.

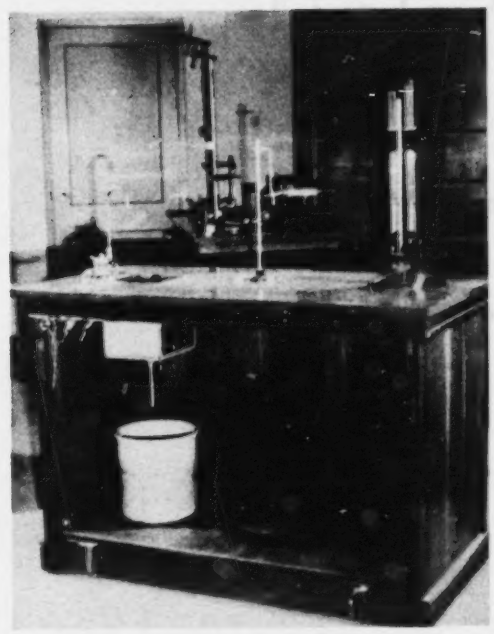


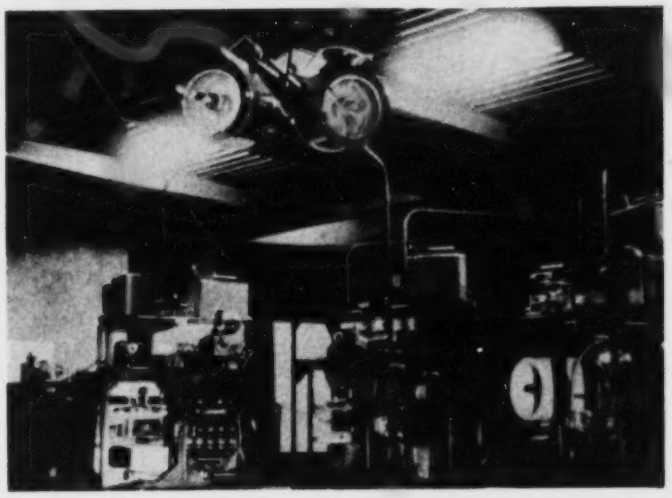
Science Preparation Room for laboratory storage.

The room is further equipped with a mobile demonstration table for each of four areas (physics, chemistry, zoology, and botany), providing for preparation of experiments and demonstrations in a laboratory, after which the table, in complete readiness, can be rolled into any of the classrooms for demonstration before the students.

Film laboratory equipment, previously located in another part of the campus, is being improved and modified for installation in the Center. Such installation will provide complete facilities for developing and printing 16 millimeter sound films for use in any of the complex areas of the Center, and will provide capability of reproduction into 2 x 2 slides of material from any source.

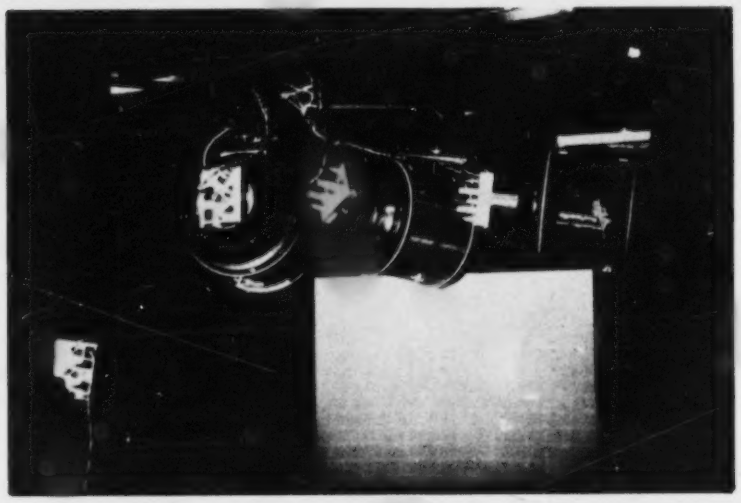
Mobile demonstration tables for science classes.



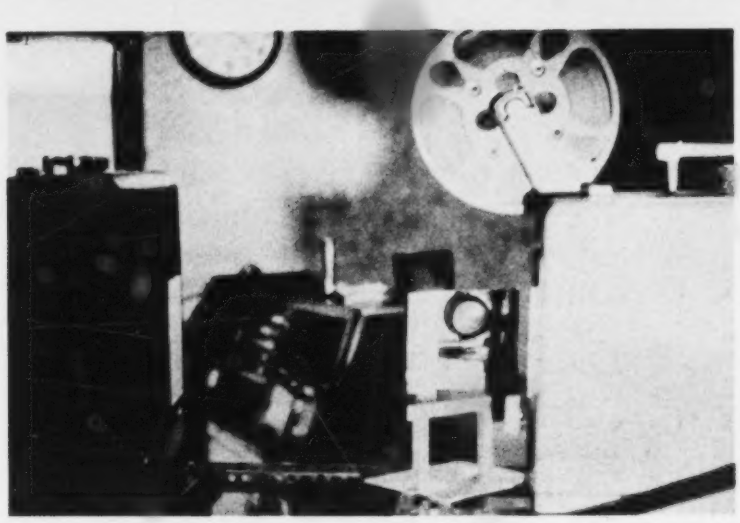


Central core of building contains projection equipment.

The central core of the building, as previously mentioned, contains all projection equipment. As a solution to the problems of self-interference by the projectors, the television projector heads are mounted above the clusters of conventional projectors with each classroom screen being fed by an individual group or cluster of conventional projectors. When the conventional projectors feed into front surface mirrors to reverse the image projected on the screen the viewed image is in proper perspective.



TV projector head mounted above conventional projectors.

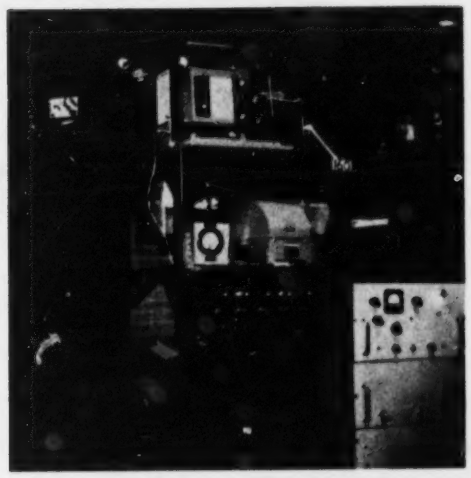


Conventional projectors feed into front surface mirror and reverse image.

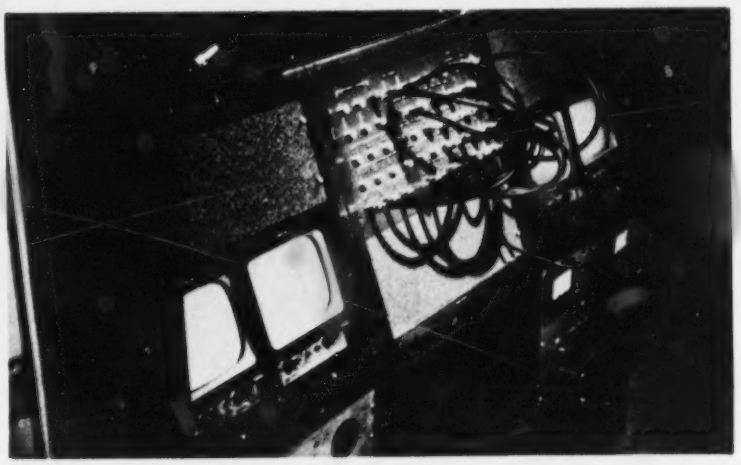
The screens are constructed from flexible vinyl, and are 10 feet square with the picture area masked to 6 x 8 feet, (a dimension dictated by the size and proportion of the televised picture), and are backed by sheets of plate glass to insulate the classrooms from any projection or operational sound.

The projection clusters are mounted on a platform which enables proper projection angles and distances. Space beneath the platform is used for placement of electronic audio and video controls.

At the control area of the projection core patch-panels make possible the dispersion of various sources of audio and video to individual classrooms with controls for audio volume and video contrast, brilliance and perspective.

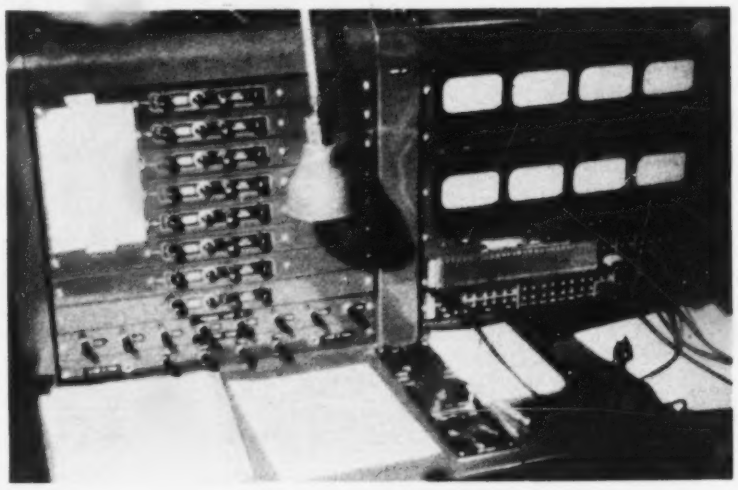


Projection clusters mounted on platform.



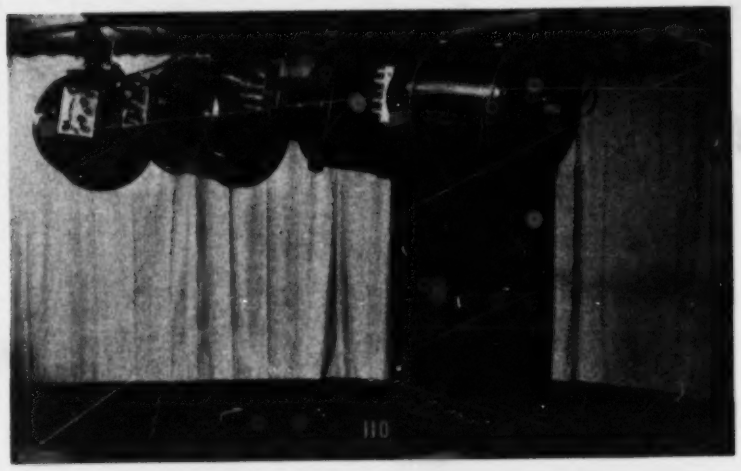
Control area of the projection core.

Sources of audio include audio tapes, discs, external radio (live or delayed), and live lectures from studio and classrooms. Video sources include live or video-taped material from the building-connected television studio, live or video-taped material from local commercial and educational television stations, video-taped, kinescopes, films and slides from other institutions and from commercial agencies.



Many sources available for audio and video material.

The screen of each classroom is equipped on the projection area side with a draw-drape so that a classroom in conventional use, or using an overhead projector, cannot spill light into the projection area. Doors entering the classroom from the projection area are fitted with a wide-angle lens (or peephole) to minimize unnecessary interference of classes.



Classroom screens equipped with draw-drapes.

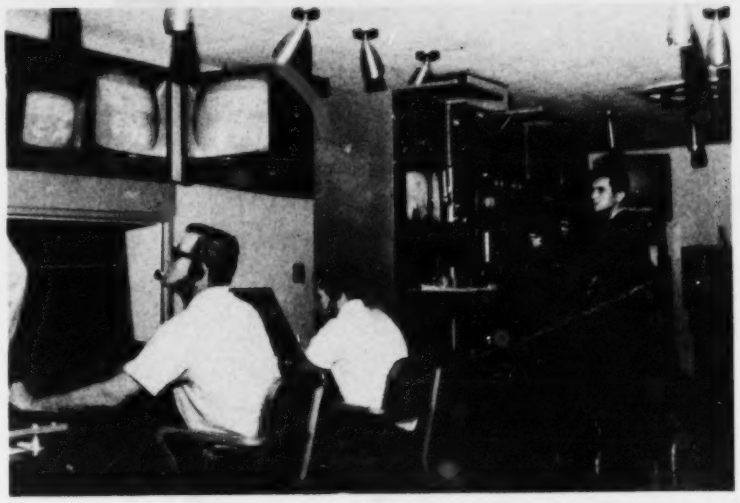
Projection equipment in the core area includes eight Bell and Howell "540" 16mm sound film projectors, eight Wollensak automatic 2 x 2 slide projectors, eight DuKane film strip projectors, eight Bessler 3¼ x 4 slide projectors with Genarco changers, six General Precision Laboratories 611-A television projectors and a portable Balomatic 2¼ x 2¼ slide projector for use with any of the complexes. The optics in all projection equipment have been modified to fit the determined viewing screen size.

To make possible the integration of color into televised lectures, circuits have been constructed allowing relay-controlled interjection of colored slides and films into the classrooms at the desire of the director of the televised lecture. Although it is occasionally necessary to produce five or six copies of color slides or to rent multiple copies of color films, we have in effect colored television without the considerable cost of colored television equipment. The industrial type vidicon cameras, previously mentioned, would be

used in conjunction with classroom science demonstrations; future plans also include the dissemination of the pictures resulting from such vidicons to other classrooms, hereby allowing classrooms to be used as secondary studios.

The television studio and control room adjacent to the classroom complex are conventionally equipped with three RCA TK-15A vidicon cameras, an RCA TS-11 switching console, and RCA TRT-1B video-tape recorder, a 50 kilowatt Century 1-C auto-transformer

Television studio and control booth are conventionally equipped.



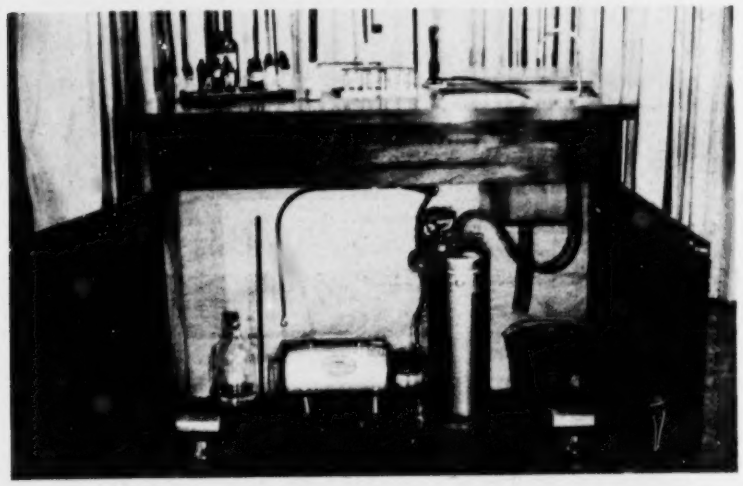
Control booth located adjacent to classroom complex.

lighting board, and an RCA-BC-3C audio console with five mixing channels and accommodations for two turntables, and audio tape recorder, remote, network and auxiliary channels.

Television projection-room equipment includes an RCA-TP 6A film projector and a

twin-turret Selectro-slide Senior slide projector feeding into an RCA vidicon multiplexer.

Two production items homemade for studio use are worthy of special notice: The first, the mobile laboratory demonstration table, mentioned earlier, has self-contained sources of water, gas, and compressed air, so that demonstrations can be prepared prior to rolling the table into the studio; the second item is constructed from a large roll of wrapping paper, a washing machine motor, and numerous gears and levers, and provides a substitute for the conventional and television-bothersome blackboard. The roll of paper is written on with grease pencil, and can be reversed for re-emphasizing lecture points, for daily review and for semester-long recall.



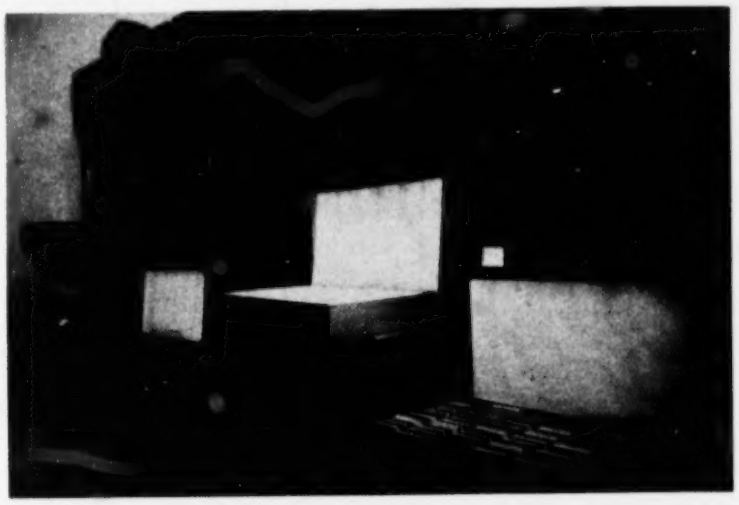
Mobile science tables have self-contained sources of water, gas, etc.

TV studio of the Center serves triple purpose.

The television studio of the Center serves a triple purpose in that it is used for production of University College lectures, as a laboratory for the University radio-television-film academic department, and for the production of programs which are video-taped for local television stations. Future plans for television coverage on the campus include coaxial cable feeds to other classroom buildings, to dormitories, and to student activity buildings. One of the most popular uses for the Center is the projection of televised games when University of Miami teams are playing away from home.

That our faculty members engaged in television teaching fully subscribe to the maxim that a

picture is worth a thousand words is testified to by the printing of 10,000 2 x 2 slides and 5,000 super imposure cards during our first three semesters of TV teaching. All visuals including slides, cards, and mounted pictures, are cross-indexed by title, content, and previous lecture use.



Slides and super imposure cards are cross-indexed.

The production staff is also responsible for a rapidly expanding reference library which already includes complete issues of such magazines as *The National Geographic, Life, Look,* etc., as well as a number of books on history, art, science, and related subjects.

The design of the Learning and Instructional Resources Center and the concentration of equipment which it contains provide a challenge toward the solution of problems which have plagued instructional television since its inception.

Production staff is responsible for reference library.

Through the medium of television, education has moved further from Mark Hopkins' concept of a teacher and a student at opposite ends of a log than at any time in history. Adverse criticism of televised education is often concentrated on the lack of interaction between student and instructor. In an effort to determine the desirability and

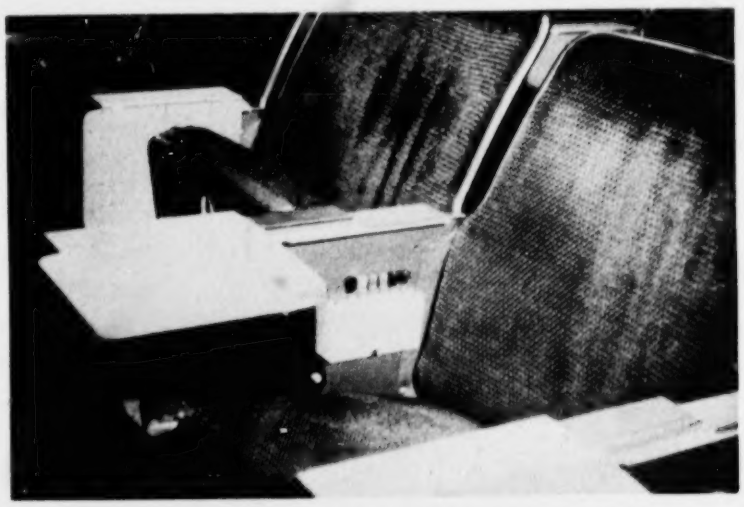
This Division is responsible for overall administration.

effectiveness of such interaction, the University's Division of Communications Services, supported by a grant from the General Electric Foundation and in cooperation with General Electric's Educational Technology and Products Project, has designed and installed an electrical feedback system, which enables the student to make up to 32 responses to programmed questions. The installation further makes possible the continuous and immediate indication to a lecturer either on television or in the classroom of the cumulative degree of understanding of large-group classes.

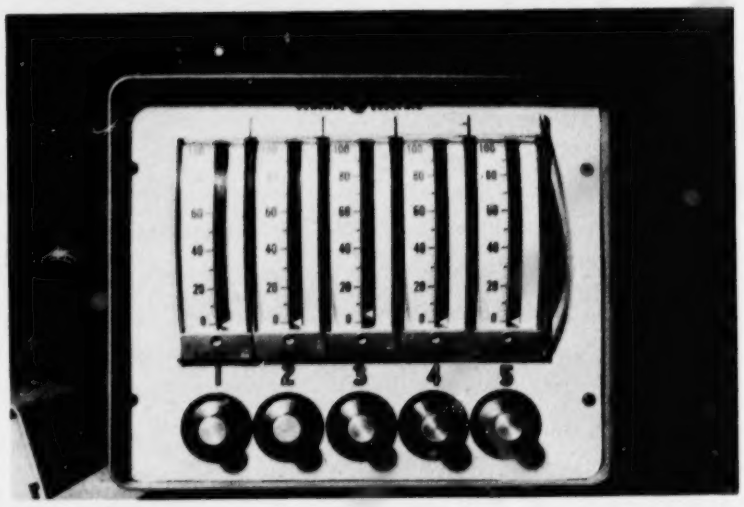
We hope in the immediate future to gain support for research which will provide answers to such questions as: How can instantaneous student response, accomplished electronically, affect instructional programming in large-group instruction by television? Other questions to which answers may be found by using the Center as a research tool are: In a combination of visual and aural education, which component provides greater emphasis toward understanding and retention of material taught? Where various academic disciplines overlap to some degree in content, is it practical to combine large-group

classes for instruction? What physiological factors contribute to or deter successful learning? All of these questions and many more can be researched by the electronic feedback system.

Fundamentally, the plan is to install at each seat an easily operated and easily concealed response station of five pushbuttons. The output of these response stations is fed into a relatively simple analog type computer-integrator, which in turn feeds into a readout device placed before the instructor. The readout is on meters corresponding to the five pushbuttons at the response stations.



Student response station feeds to the instructor.



Instructor's read-out device corresponds numerically to response button.

Continuous chart recorders corresponding to each of the buttons keep a permanent, real time, analog record of the class responses for analysis after the lecture. These charts may be directly compared with the original lecture delivery by

simultaneous playback with a recorded videotape of the lecture. Future refinements of the system include the ability to record individual responses on perforated paper tape and punch cards for data processing in RCA 301 and IBM 1620 computers for the purposes of more detailed analysis and research.

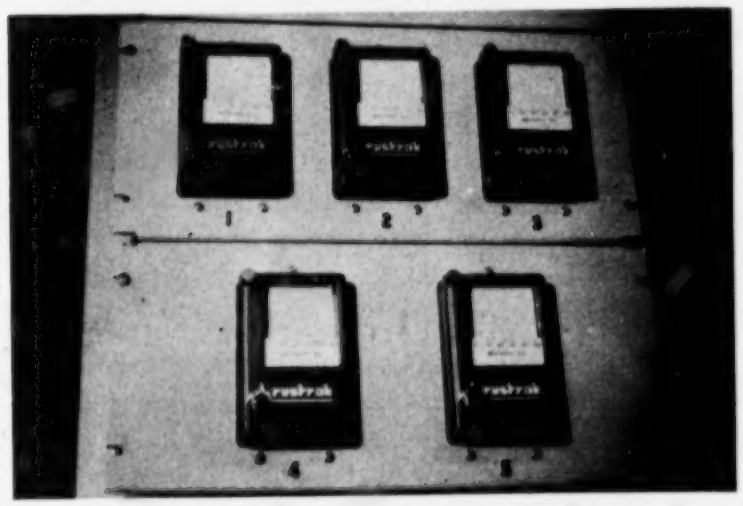


Chart recorders keep record of classroom responses for later study.

PERSONNEL FOR OPERATION

Personnel for operation of the Center is divided into four categories: administration, production, technical and audio-visual aids.

The Director of the Division of Communications Services is responsible for overall administration of the Center and is aided by an Administrative Assistant who keeps records, administers business details and supervises secretarial work.

The technical section of the Center, which bears responsibility not only for actual operation and maintenance of Center equipment but also maintains the majority of audio-visual equipment and all radio and television equipment on the campus, is headed by the Assistant Director of the Division of Communications Services and by two technical supervisors, one with responsibility for operation and maintenance of projection equipment, the second with responsibility in the area of electronics.

Eight technicians complete the technical section and staff a fully equipped technical shop and laboratory where equipment peculiar to the unique needs of the Center often is designed and built.

Eight technicians staff fully equipped technical shop.

The production section of the Division is responsible for the training of faculty for television teaching at the request of the faculty, for the direction of all University College televised lectures, for aiding classroom lecturers in the preparation of audio and visual aids for enhancement of their lectures and for maintaining the necessary visual libraries and properties for use in television. The full-time production staff includes a production director, two producer-directors, two cameramen, and a staff artist.

The additional positions of floor manager, audio operator, visual librarian, and production secretary, are filled by student assistants drawn from among University students majoring in radio-television-film. The production section maintains a well-equipped shop, making possible the construction of any kind of property needed to support the television effort being made by the faculty.

Shop where much Center equipment is designed and built.

The Audio-Visual Aids section, although basically concerned with the needs of University Schools and Departments outside University College, plays an important role in Center operation by assuming responsibility for the location and rental of films, film strips, etc., for use in Center lectures by television and by conventional methods. The staff of the Audio-Visual Aids department consists of a Director, a secretary, and a varying number of student assistants.

This, then, is a description of our Learning and Instructional Resources Center. We think of it as a laboratory to aid the faculty in a continuing search for ways and means to teach more students more effectively and more economically than we have done before.

When we add to the resources described here, our instruction through small group discussion sections, our independent reading and study programs, our writing laboratories, all a part of the academic program the Center is designed to serve, we feel that we are making some progress toward the solution of the problems that face all of us in higher education today.